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10/577,421	04/27/2006	Wayne Sainty	ST005US	4741

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EXAMINER	
MASKELL, MICHAEL P	
ART UNIT	PAPER NUMBER
2881	
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08/15/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/577,421	SAINTY ET AL.	
	Examiner	Art Unit	
	MICHAEL MASKELL	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,14,16-26 and 30* is/are rejected.

7)☒ Claim(s) *8-13, 15, 27-29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

The supplemental declaration filed 07/15/2008, which includes the signature of William Waller, obviates the previous objection to the declaration. Said objection is withdrawn.

Claim Rejections - 35 USC § 112

The applicant has amended claim 17 to depend upon claim 16, thus providing the required antecedent basis for the term "DC voltage." The rejection is withdrawn.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-7, 14, 16-26 and 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Pierrejean (U.S. Patent 6,388,384) in view of Pollard, et al ("Electron-impact ionization time-of-flight mass spectrometer for molecular beams" Rev. Sci. Instrum. 56(1) January 1987 pp.32-37).

Regarding claims 1, 18 and 30, Pierrejean teaches a pulse mode electron generator comprising a cathode **(1)** that emits electrons, and an anode (3) that accelerates the electrons, wherein the anode voltage signal comprises a voltage that modulates between a first voltage above a threshold and a second voltage below the threshold (abstract). Pierrejean does not teach the application of this electron generator

in an ion source, and accordingly does not teach a gas supply that causes gas to be provided to an ionization region of the ion source. However, Pollard teaches electron-impact ionization methods that call for a pulsed electron generator (Introduction) such as that taught by Pierrejean. Further, Pierrejean cited Pollard's paper in his application for the patent, clearly indicating that one of ordinary skill would be familiar with both teachings and consider them applicable to and compatible with each other. Pierrejean teaches that his particular electron source is particularly efficient, so one of ordinary skill would have ample reason to choose it as the particular electron source for Pollard's apparatus. The specific electronic control system to send signals to the various components of Pierrejean's and Pollard's teachings are not depicted; however, since the mode of operation of the ion source is clearly spelled out in the teachings, the provision of a control system for an ion source comprising an anode voltage generator, a gas supply signal generator and a cathode signal generator, wherein the anode voltage generator provides a voltage signal to an anode of the ion source, wherein the gas supply signal generator generates a signal to cause a gas to be provided to an ionization region of the ion source, wherein the cathode signal generator generates a signal to cause electrons to be emitted by a cathode of the ion source such that electrons emitted by the cathode are accelerated toward the anode to cause ionization of the gas, and wherein the anode voltage generated comprises a voltage that modulates between a first voltage above a threshold and a second voltage below a threshold would have been obvious to one of ordinary skill in the art in order to render both teachings functional. Such control systems are well within the skill of an ordinary

lab technician to apply and program, given that the particulars of the method to be implemented by the control system are spelled out by the prior art teachings. Further, for the same reason, the method of operating the ion source by actually providing said signals to cause the components to operate according to the prior art teachings (as in claim 1) would have been obvious to one of ordinary skill in the art at the time the invention was made. Finally, applying the electron source taught by Pierrejean in the electron-impact ionization source taught by Pollard also causes an ion beam system comprising said ion source to be further taught (Pollard's Fig. 1, the source is used in a TOF-MS system which uses an ion beam), as in claim 30.

Regarding claim 2, Pierrejean teaches wherein the threshold is an electron emission threshold of the cathode; Pierrejean does not teach that this is an ionization threshold because Pierrejean teaches the electron source independently and not in the context of an ion source. However, when used in the obvious combination with Pollard as described above for the motivations given above, the electron emission threshold of the cathode becomes an ionization threshold, because Pollard teaches electron-impact ionization which begins when electrons are emitted into the gas.

Regarding claim 3, Pierrejean teaches setting the threshold and the frequency and duty cycle of the modulation such that the ion current is extinguished during the period when the anode voltage signal is below the threshold (column 2, lines 18-31 and abstract).

Regarding claims 4-6 and 26, Pierrejean teaches wherein the threshold is approximately 100, 60, or 40 volts (column 1, line 19).

Regarding claims 7 and 25, Pierrejean teaches wherein the second voltage is approximately zero (Fig. 2).

Regarding claims 14 and 19, Pierrejean teaches wherein the anode voltage comprises a rectified signal (Fig. 2), and since the mains supply is the most readily available source of alternating current signal, it would have been obvious to one of ordinary skill in the art to take advantage of it and put it through a rectifier to obtain the taught rectified signal.

Regarding claims 16 and 17, Pierrejean teaches further providing a DC voltage to the anode and wherein the DC voltage is less than the threshold (Fig. 2).

Regarding claim 20, Pierrejean teaches wherein the circuit generates a variable mains rectified voltage (Fig. 2).

Regarding claim 21, Pierrejean does not teach a bridge rectifier, but such a circuit is simple for one of ordinary skill in the art to construct, and since, as discussed above, the use of a rectified mains signal would have been obvious, it would have also been obvious to construct and apply a bridge rectifier circuit to provide it.

Regarding claim 22, a standard bridge rectifier circuit comprises an anode voltage output and a ground, and further comprises a capacitor between the output and ground. Such a circuit is well known in the art and as discussed above would have been obvious to apply.

Regarding claims 23 and 24, Pierrejean teaches wherein the circuit further generates a DC voltage to the anode and wherein the DC voltage is less than the threshold (Fig. 2).

Allowable Subject Matter

3. Claims 8-13 and 27-29 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art gives no indication of particularly favorable frequencies for the voltage cycle. The prior art also gives no indication to use a fault condition threshold as the threshold, or to use an unregulated voltage signal.

Response to Arguments

4. Applicant's arguments filed 04/09/2008 have been fully considered but they are not persuasive.

5. The applicant's first argument, in regards to claims 1, 18 and 30, is that Pierrejean allegedly fails to teach an anode voltage that modulates between a first voltage above a threshold and a second voltage below the threshold. The applicant points out that the anode 3 in Pierrejean has a permanent bias applied by voltage supply 26, and that the modulating voltage VGK is applied to grid 13. Thus, the applicant states that the potential difference between the anode and cathode is fixed.

However, voltage is a quantity that is defined by a difference in potential at two locations. The claims do not specify what component the voltage signal applied to the anode is measured with respect to. The scope of the claim therefore encompasses voltages measured between the anode and any other component. Since the grid 13 has a modulated potential applied to it, the potential difference (i.e. voltage) between the anode and the grid modulates according to the signal VGK.

There is also an additional interpretation by which Pierrejean teaches an anode voltage that modulates between a first voltage above a threshold and a second voltage below the threshold. The grid 13 is biased positively with respect to the cathode 1, and serves to accelerate electrons away from the cathode; therefore, the grid 13 is by definition an anode in this device. Under this interpretation, Pierrejean even more clearly teaches an anode voltage that modulates between a first voltage above a threshold and a second voltage below the threshold.

6. The applicant's second argument, in regards to claims 1, 18 and 30, is that "a person skilled in the art would readily understand that a mass spectrometer (taught by Pollard) is not an ion source, that a mass spectrometer has a very different construction to an ion source, and that a mass spectrometer has a very different application to an ion source" and that "Pollard in combination with Pierrejean teaches only a mass spectrometer and does not teach an ion source."

This argument completely ignores the examiner's explanation in the original rejection that Pollard teaches an ion source *for* a mass spectrometer, and pulsed electron generators like Pierrejean's are used in electron impact ion sources for said mass spectrometers. Pierrejean even cited the Pollard reference, clearly indicating a suggested application of Pierrejean's apparatus to an electron impact ion source for Pollard's mass spectrometer. The combination of teachings teaches a mass spectrometer *with an ion source as claimed.* The presence of additional components in the prior art combination beyond what is claimed (such as the mass spectrometer) does not cause the claims to be distinguished over the prior art.

7. The applicant's third argument, in regard to claim 2, is that the combination does not teach "wherein the threshold is an ionization threshold." The applicant states that the examiner's explanation that the electron emission threshold may be considered to be the ionization threshold in the combination is confusing. The examiner's position is that, since the combination of Pierrejean with Pollard results in Pierrejean's electron source to be used as an electron impact ionization source, the threshold that causes the electrons to be emitted from Pierrejean's electron source is an ionization threshold. Whenever the threshold is crossed by the anode voltage signal, electrons are emitted from the cathode. When electrons are emitted in an electron impact ion source, ions are created by electrons impacting with sample gas. Therefore, the threshold may be considered an ionization threshold, because crossing it causes ions to be formed.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL MASKELL whose telephone number is (571)270-3210. The examiner can normally be reached on Monday-Friday 8AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571/272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jack I. Berman/
Primary Examiner, Art Unit 2881

/Michael Maskell/
Examiner, Art Unit 2881
12 August 2008